

1/25/2011

Ask a Builder

By Cold Climate Housing Research Center Staff

The "Ask a Builder" series is dedicated to answering some of the many questions Fairbanks residents have about building, energy and the many other parts of home life.

The outdoor air quality index for Fairbanks is frequently in the "unhealthy" range, but I've heard that indoor air quality can be bad in the winter too. Please explain this.

A multi-season study by the American Society of Heating, Refrigerating and Air-Conditioning Engineers of 108 new single-family homes in California focused on the effectiveness of different ventilation techniques. The study monitored 22 volatile organic compounds (VOCs) including formaldehyde, PM 2.5, CO₂ and others. These substances are hazardous to human health and some are known carcinogens. The study found that homes without adequate ventilation held more pollutants. The more a home exchanged bad air for good air, by way of a heat recovery ventilator or forced air unit, the cleaner the air in the home. However, running these systems intermittently was often not completely effective in taking care of indoor pollutants. During off-times, the level of pollutants grew substantially, whereas continuously running these systems produced much cleaner air.

These VOCs come from a variety of sources. Most commonly, building products and objects brought into the home "offgas" hazardous compounds into the air over their lifetime. Formaldehyde is found in wood composite products such as cabinetry, doors, plywood, trim and furniture. Carpets, plastics and other materials also release gases. It is well known in the Interior that wood burning can generate high levels of PM 2.5. Houseplants and pets can also release particles that need to be sent outdoors.

But what significance would a California study have on residential housing in Fairbanks and other parts of Alaska? Alaska has longer winters, so people spend even more time indoors and even more time with closed windows. So lack of adequate ventilation, or no ventilation, has a dramatic effect on indoor air quality. Furthermore, lack of ventilation can cause the level of moisture in a home to go up dramatically. Excess moisture can cause respiratory illness to people by causing mold growth, and damage to a home by way of rot. Condensation on windows is one sign a home may not be getting enough ventilation, because the moisture is not being expelled efficiently.

The full article on the air quality study is available here:

<http://www.airtechhumidity.com/airtechwp/wp-content/uploads/ASHRAE-NOV-2010-IAQ-in-AirTight-Homes1.pdf>.

Ask a Builder articles promote awareness of home-related issues. If you have a question, contact the Cold Climate Housing Research Center at info@cchrc.org or (907) 457-3454.